# Reducing the Pink White Ratio for Better Aesthetics -A Perio-Restorative Treatment Approach to Manage Gummy Smile of Periodontally Compromised Teeth

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## Abstract

Assorted periodontal treatment procedures aimed at reinforcing weak teeth and clinical crown lengthening procedures for placement of better restorations bid periodontics a vital role in multi disciplinary dental clinical practice. However in additional clinical crown length demanding restorative cases, gingivectomy could be made more effective by combining it with subtractive osseous surgery of underlying alveolar bone. This combination gives a functional aid in restorative dentistry and also is used in the correction of excessive gingival exposure during smiling commonly known as*' gummy smile'*.

In such cases, the concerned teeth are root canal treated and more clinical crown length is attained with gingivectomy extending even apical to the free gingiva to a predetermined level subject to the availability of attached gingiva and alveolar bone. This is followed by resection of exposed alveolar bone to achieve maximum clinical crowns for the teeth, placing the marginal bone level at least 3 mm apical to the new gingival margin. The gingival margins are tightly sutured to the bone tooth interface. The area is allowed for complete healing with new gingival sulcus, and teeth are then prepared to desirable level for receiving more aesthetically pleas able crowns in its new position.

This less discussed face of periodontal surgery and its combination with two restorative specialty aimed at achieving the best aesthetic rehabilitation for patients with excessive gingival exposure during smiling is presented here in detail with 4 completed illustrative clinical case reports. The indications of this interdisciplinary clinical practice involving Endodontics, Periodontics and Prosthodontics, its area of application and limitations are also highlighted.

KEYWORDS: Gummy smile, Perio aesthetic surgery, gingivectomy

## Introduction

Esthetics is an inevitable part of dentistry [1], but esthetic dentistry is not a separate speciality subject by itself rather; every procedure in dentistry needs to satisfy this aspect, to call itself a success [2,3]. Apart from fulfilling the functional demands of restorative dentistry, periodontal procedures do aid in aesthetic applications of dental restorative procedures. Also, the swift growth in patients seeking complete oral rehabilitation [4,5] rather than a discrete treatment approach upon its need, multidisciplinary clinical approaches would become a necessity in managing them.

Here are few cases where sensible handling of periodontal and endodontic tissues, along with unlimited imagination of prosthodontics, being effectively utilized to manage aesthetically challenging situations where its conventional management techniques stood helpless.

**Case details:**

Four cases with chief complaints related to unaesthetic appearance during smiling, resulting from excessive gingival skeleton is presented here. They all had evident periodontal complaints, contra indicating orthodontic correction or orthognathic surgery [6,7,8,9]. Though sufficient attached gingiva was noticed in common, mere

gingivectomy or flap surgery aimed at pocket elimination would result in gingival recession and might worsen the aesthetic appearance [10,11].

When the conventional management technique for prognathic maxilla with excessive gingival exposure fails, and the patient is still incisive on aesthetic rehabilitation without extracting any teeth, a combined periodontal – restorative treatment approach could be an alternative choice [11,12,13,14].

***Aim*** of the treatment was to give each patient the best possible aesthetic appearance during smiling with periodontal surgical and restorative methods.

***Objectives*** of the treatment in general were to correct,

1. the '*gummy smile*' appearance
2. the proclined upper anterior teeth
3. the periodontal health of the weak upper anterior teeth
4. unaesthetic shape and spacing between upper anterior teeth

The **stepwise management protocol** in general included,

1. evaluation of any radicular and periodontal pathology of selected teeth [15]
2. radiographic assessment of the quantity and quality of alveolar bone and root area
3. clinical evaluation to confirm the availability of attached gingiva for surgery [14,16,17,18,19]
4. thorough Phase 1 Periodontal therapy
5. intentional RCT of teeth proposed for correction [4,17]
6. gingivectomy and resective osseous surgery to create maximum clinical crown length [10,13,19]
7. allow sufficient time for surgical area to heal completely [10]
8. teeth preparation at new gingival margins to receive short desirable crowns [17]
9. schedule a frequent follow up program

**Treatment procedure**

A thorough clinical and radiographical assessment of the concerned area to rule out any major pathology is the preliminary step in treatment planning. Adequate width of attached gingiva, sufficient alveolar bone and long roots are among the prime requisite for this treatment. Completion of phase 1 periodontal therapy and observation of its maintenance prior to the surgical phase is a mandatory procedure. The management approach of three speciality pertaining to these 4 cases in general is described here.

**The role of an Endodontist**

The amount of root exposure required, its inevitable consequence of sensitivity and the future intensive tooth preparation required for receiving desirable size of crowns indicate the need of intentional root canal treatment of all the teeth under consideration. An optimum size in access opening conserving as much as tooth structure possible is a key factor in long term success of this treatment

**The role of a Periodontist:**

The hub of this treatment is a sturdy periodontium of concerned teeth and the aim of a Periodontist is to create maximum length of clinical crowns to receive the most aesthetic crowns over it. Creating extra clinical crowns should also consider the feasibility of incorporating pocket-eradicating surgeries.

Taking into account the quantity and quality of remaining root structure and alveolar bone, an appropriate crown lengthening procedure among gingivectomy or flap surgery is designed. The gingivectomy incision or an apically positioned flap is designed to expose the alveolar area to the desired level of future crown margins. The exposed alveolar bone should be resected to a level at least 3 mm apical to the new gingival margins exposing the roots [16]. The gingival margins are tightly sutured to the bone tooth interface to avoid an exposed wound area and to favor fast healing of gingival margins. This procedure would hinder the re-growth of gingival tissue and favors the formation of healthy gingival sulcus and biologic width in the newly created marginal gingival level. [10,13,20] A completely healed gingival margin should be devoid of any inflammatory changes and further gingivoplasty surgery may be required to accomplish this prior to final crown preparation [14,17].

A view of bone resection at the level of gingivectomy is illustrated in Fig.1.

**The role of a Prosthodontist**

Placement of temporary crowns immediately after primary wound healing at the new gingival margins is an essential procedure in this treatment plan since the resected tissues possess a fast healing potential to repair[10,20]. Permanent crowns are designed after complete healing; and the preparation should consider the unpleasant part of gummy smile, proclination, length and shape of teeth and spacing between teeth and individual aesthetic distinctions of each case.

A case with teeth prepared for permanent crown after complete healing of the gingiva is shown in Fig. 2.

**Management outcome**

Usual management of such cases were centered on the possibilities of orthodontic or orthognathic surgeries. When these management techniques fell short of its indications such combination procedures may be considered an alternative technique in fulfilling the aesthetic need of the patients.

The outcome of these 4 cases comparing the pre and post operative extra oral and intra oral views highlighting lip competency at resting position, proclination, shape, size and position of teeth along with the present level of gingival exposure during smiling are illustrated as sets from fig.3 to fig.6.

**Discussion**

The chief complaints of patients in all the four cases discussed here were purely aesthetic motivated rather than a functional problem. Owing to their unsatisfactory

Figure -1 After soft tissue reduction

Figure -2 Tooth preparation for crowns

Figure -3a Pre-Op extra oral

Figure -3b Post-Op extra oral

Figure -3c Pre-Op intra oral

Figure -3d Post-Op intra oral

Figure -4a Pre-Op extra oral

Figure -4b Post-Op extra oral

Figure -4c Pre-Op intra oral

Figure -4d Post-Op intra oral

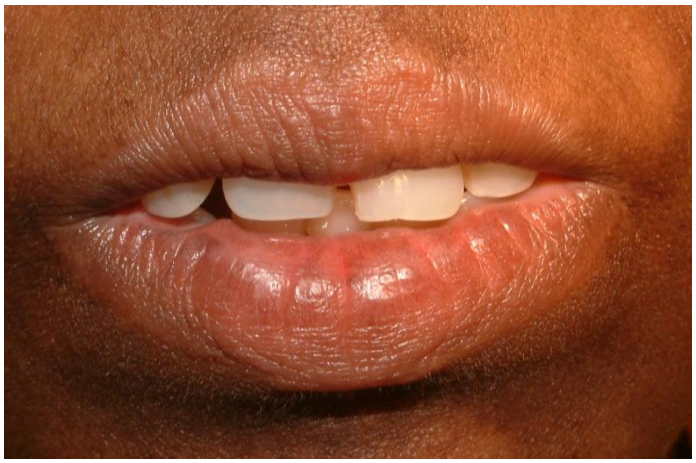

Figure -5a Pre-Op extra oral

Figure -5b Post-Op extra oral

Figure -5c Pre-Op intra oral

Figure -5d Post-Op intra oral

Figure -6a Pre-Op extra oral

Figure -6b Post-Op intra oral

periodontal health conditions the patients were denied from the conventional management of these situations and hence a combined effort of three different specialities in dentistry had to derive a treatment plan to correct it. Intentional root canal treatment and surgical exposure of clinical crowns of all involved teeth gave enough room for crown preparation at higher levels on teeth [10,13,19]. This limited the extra gingival visibility during smile and also aided in placing the crowns maximum inside and rendered it new shape. All the complaints of these patients were well attended and the changed looks were acceptable and impressive for them.
However, a thorough clinical and radiographic assessment of attached gingiva and alveolar bone, in terms of its adequacy and quality is a definite pre-requisite for this procedure. A favourable root morphology and sufficient root length is yet another deciding factor in its successful outcome.

**Conclusion**

With its rapid growth and increased demand of precise skill, dentistry branched into several specialities and even super specialities. But interdisciplinary dental practice, combining specialities, paved way to several management techniques especially in the field of cosmetic dentistry, beyond its exclusive applications. The present article was focused on the aesthetic potential upon mixing three restorative specialities of dentistry, restoring structures around tooth, inside the tooth and the constructions done over it, adding colours to clinician's imagination.
The four case reports illustrated here were tailor made exclusively for each condition. These techniques do not have any exclusive indications nor is it a substitute to conventional orthognathic surgeries, though it can be used along with it, if required.
This procedure as a whole or as parts of it is just another clinical technique in a dental practitioner's armamentarium where the guidance for treatment planning is not conventional thinking, but purely clinician's imagination, driven by a single aim of giving the best of our science for the patients who demands it.

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